

CENTRAL INTELLIGENCE AGENCY
PROPOSED OFFICE BUILDING

N-182

LANGLEY, VIRGINIA

OUTLINE SPECIFICATIONS

for

ELECTRICAL WORK

JANUARY 31, 1958

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DOCUMENT NO.
NO CHANGE IN CLASS.
 DECLASSIFIED
CLASS. CHANGED TO: TS S G
NEXT REVIEW DATE:
AUTH: HR 182
DATE 28/04/81 REVIEWER: 018995

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OUTLINE SPECIFICATIONS

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ELECTRICAL WORK

E-01 SCOPE OF WORK

a. All required labor, materials, equipment, and Contractor's services necessary for complete installation of Electrical Work in full conformity with requirements of all Authorities having jurisdiction; all as indicated on drawings and/or herein specified, including in general the following:

1. Electric Service System.
2. Distribution System for building light and power.
3. Lighting fixtures and lamps.
4. Underfloor duct system.
5. Telephone conduit systems.
6. Fire Alarm and Watchmans Report System.
7. Power, control, indicating and alarm wiring for mechanical equipment, except as noted.
8. Motor control centers.
9. Temporary light and power.
10. Outdoor Lighting.
11. Auditorium Sound System.
12. Clock System.
13. Building Lightning Protection.
14. Standby Generators.
15. Supervisory Alarm System.

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b. Material and equipment shall be as required by Standards of General Services Administration, Public Buildings Service, Construction Division.

E-02 WORK NOT INCLUDED

- a. Supplying of current transformers and watthour meters for Utility Company's metering.
- b. Supplying and setting of motors.
- c. Supplying of actuating devices for heating, ventilating and air conditioning, plumbing, and alarm equipment.
- d. Elevator work beyond motor-generator set controller and feeder connections to controller.
- e. Public and secure telephone systems cables and equipment.
- f. Finished patching, and finished painting.
- g. 34.5 kv primary feeders.
- h. Double Ended Master Substation, except as noted.
- i. Fuel supply, exhaust, cooling water and air intake piping systems for diesel generators.
- j. Vertical and Horizontal Conveyor work except power feeders to control panels.

E-03 GENERAL ITEMS

a. As-Built Drawings: Record all deviations from contract drawings and deliver to Owner cloth tracings showing work as actually installed.

b. Cutting: All required for Electrical Work.

E-04 ELECTRIC SERVICE SYSTEM

a. Two separate overhead pole lines, 34.5 kv, will be run to main outdoor substation by and at expense of Utility Company.

b. Main outdoor substation will be furnished by and at the expense of the Utility Company except for the following:

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1. 2 -3750/4687 kva transformers, including 13.2 kv delta primary, 4160 volt grounded wye secondary with primary taps: By Contractor.

2. Power circuit breakers, air, outdoor, 500 mva I.C. 15 kv or 150 mva I.C. 5 kv as required, for transformer secondaries, tie breaker, feeder breakers and generator breakers: By Contractor.

3. Contractor shall perform all work on load side of 34.5/13.2 kv transformers starting with connections to transformer secondary bushings.

E-05 4160 VOLT DISTRIBUTION SYSTEM

Furnish feeders from Master Substation to air conditioning compressor, chilled water pump, and condenser water pump motor controllers and motors as indicated.

E-06 13.2 KV DISTRIBUTION SYSTEM

Furnish feeders from Master Substation to 4160 volt outdoor substation, unit substations and emergency generators as indicated.

E-07 INCOMING SERVICE, TELEPHONE

Provide duct bank with concrete encased conduits from property line to Main Building and Power House as indicated.

E-08 UNIT SUBSTATIONS

Furnish spot network, askarel filled, indoor type, 13.2 kv delta primary, 277/480 volt grounded wye secondary unit substations with associated equipment, sizes and locations as indicated.

E-09 LIGHTING PANELBOARDS

a. 277/480 volt: Circuit breaker type, with "E" frame breakers. Protect all panels with silver-sand fuses in supply mains.

b. 120/208 volt: Circuit breaker type, with "E" frame breakers.

c. Furnish where indicated.

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E-10 POWER PANELBOARDS

- a. Convertible circuit breaker type.
- b. Furnish where indicated.

E-11 MOTOR CONTROL CENTERS

Each motor control center shall consist of an individual combination disconnect switch with current limiting fuses and magnetic starter with overload protection on each phase, for each motor and complete with push buttons, pilot lights and current limiting fuses protecting main busses. Busses shall be capable of withstanding 25,000 ampere short circuit stresses. Across-the-line starting for all motors 100 hp and smaller. Closed transition Auto-transformer starting for motors larger than 100 hp and smaller than 250 hp. Motors 1/2 hp and larger, 3 phase, 440 volt. Motors 1/3 hp and smaller, single phase, 120 volt. Furnish motor control center with type C wiring. Control voltage shall be 440 volt for 3 phase motors and 120 volt for single phase motors.

E-12 4160 VOLT MOTOR STARTERS

Air, indoor, magnetic, combination, full voltage starters with current limiting fuses, disconnecting switch and overload protection on each phase.

E-13 440 VOLT - 300 HP MOTOR STARTER

Combination disconnect switch with current limiting fuses, closed transition auto-transformer starter, push buttons, pilot lights, and overload protection on each phase.

E-14 CONDUIT

- a. Threaded galvanized steel. Minimum size: 3/4".
- b. Fibre or asbestos cement for concrete encasement outdoors underground; size as indicated.

E-15 WIRE AND CABLE

- a. 120/208 volt and 277/480 volt, type RH throughout, except in wet locations, RHW. Minimum size #12, except home runs longer than 100 feet for 120/208 volts and 175 feet for 277/480 volts.

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b. 4160 volt: Butyl rubber insulated, neoprene jacketed, 5 kv single conductor shielded, ungrounded per IPCEA specifications, sizes as indicated.

c. 13.2 kv: Paper-insulated, lead covered, neoprene jacketed, 15 kv three conductor shielded, ungrounded per IPCEA specifications, sizes as indicated.

E-16 WALL SWITCHES

20 ampere "L" rated similar to H & H 1991 series (277 volt). Furnish one switch for each one-fourth bay; locate in room partitions at or near doors on side opposite hinge.

E-17 RECEPTACLES

15 ampere, 120 volt, duplex, grounding type similar to H & H 5262. Furnish one duplex convenience outlet for every 100 square feet.

E-18 DEVICE PLATES

Brushed brass.

E-19 UNDERFLOOR DUCT

Furnish complete system throughout net usable office space including library stack areas as indicated on typical floor plan, except as noted. System shall be similar to Robertson UKX-18-16 with four cells per unit. For 23,000 square feet of net usable office space furnish above system covering entire floor area.

E-20 UNDERFLOOR DUCT SERVICE FITTINGS

Furnish 2100, 120 volt receptacle fittings, 7000 telephone and signal fittings and 100 3 pole 30 ampere receptacle fittings.

E-21 TELEPHONE SERVICE

Two separate systems will be installed. One for interior use and one for outside service. Instruments, cables, wiring, terminals, switchboard and switching equipment will be provided by telephone company. Raceways, outlet boxes, underfloor duct inserts, and strip boxes shall be furnished by Contractor.

a. Provide empty conduits from Telephone Equipment Rooms to telephone closets as indicated. Vertical runs of telephone cables in closets will be exposed and run via slots in floor except as indicated.

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b. On each floor provide 42" x 36" x 4" strip boxes, two per each 2100 sq. ft. of net office area. Connect each strip box to nearest UFD junction box with UFD duct extension as indicated on typical floor plan.

c. Strip boxes are located in pairs to serve the two telephone systems. Two telephone closets will be located in each 14,000 sq ft of net office area. Run one 2" conduit from each strip box to telephone closet in area. Do not connect a pair of strip boxes to same closet. (See typical floor plan).

E-22 LOCAL TRANSFORMERS

A 120/208 volt distribution system will be required to supply incandescent lighting, floor power, electronic analyzers, kitchen equipment, and other miscellaneous systems. This voltage will be obtained through local dry type transformers with 480 volt primaries, located in unit substation rooms. Total capacity of these transformers shall be 4000 kva.

E-23 FIRE ALARM SYSTEM

a. Equipment will be furnished and installed by A.D.T. Allow \$16,710.00.

b. Furnish conduit and wire for the following system:

1. 10 general alarm circuits and one pre-signal alarm circuit with a two-circuit recorder.

2. Alarm stations and gongs located as follows:

Ground Floor	- 20 stations - 20 gongs
1st Floor	- 20 stations - 20 gongs
2nd thru 7th Floors	- 10 stations each floor - 10 gongs each floor
Penthouse	- 4 stations - 4 gongs
Basement	- 6 stations - 6 gongs

3. Twenty-five sprinkler alarm and CO₂ alarm stations.

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E-24 WATCHMANS TOUR SYSTEM

a. Furnish wired watchmans report system of the closed circuit supervised type, as indicated.

b. Stations shall be located in such a manner as to compel watchman to follow designated tour and report at each station within predetermined time limit. Failure to do so shall sound alarm at a central point. Stations shall include an indicator lamp to alarm guard to call guard office. Lamps shall be controlled from a central point.

E-25 SOUND SYSTEMS

a. Provide empty conduit and outlet boxes for the following areas:

1. Auditorium.
2. Two theaters on First Floor.
3. Cafeteria.

b. Systems shall utilize multiple speakers for low level area coverage.

E-26 CLOCK SYSTEM

Clock system shall be synchronous automatic self-regulating non-wired (electronic) type consisting of 1200 secondary clocks, with outlets, 600 blank outlets, master clock and necessary transmitters or frequency generators.

E-27 TEMPORARY LIGHTING AND POWER

Furnish temporary lighting and power for construction purposes.

E-28 EMERGENCY GENERATORS

a. Furnish two 2000 kw generators, including control and associated equipment. Generator output shall be at 13.2 kv. Contractor shall install, test and make ready for service the generators and associated equipment.

b. Fuel supply, exhaust, cooling water and air intake piping storage tanks and fuel oil transfer pumps will be furnished under specifications for HVAC.

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E-29 LIGHTING SYSTEMS

a. Office Areas: Furnish surface mounted fluorescent fixtures 12" x 48" x 4" deep utilizing 2 - 40 watt T-12 Rapid Start lamps. The fixture body shall be constructed of 20 gauge steel. The diffuser shall consist of a 12" x 48" louver with 1" square openings, and it shall be mounted in a hinged metal frame. The fixture cross section shall be rectangular in shape so the entire top side is flush with the ceilings when installed. All metal parts including the louvers shall be finished in baked white enamel. All ballasts shall be for 265 volt operation, have high power factor, U.L. label, and E.T.L. certification. All lamps shall be Rapid Start Standard Cool White.

b. Exit Lights: Furnish exit fixtures rectangular in shape (approx. 9" x 13" x 4" deep) utilizing 2 - 15 watt lamps. The fixture body shall be constructed of 20 gauge steel and shall have a hinged door with red glass panel and 6" white letters. The fixture shall have a bottom glass white lens.

c. Stair Lights: Furnish 48" fluorescent fixtures for 2 - 20 watt T-12 lamps similar to PBS Standard #406. Ballasts shall be trigger start for 120 volt operation.

d. Mechanical Spaces: Furnish RLM reflectors of wattage indicated on drawings.

e. Lobbies and Entrance Areas: For each 100 square feet of area furnish one 24" square recessed fluorescent lighting fixture, utilizing 6 - 20 watt T-12 lamps. The diffuser shall be 1/8" white plexiglas mounted in a hinged frame. Fixture shall be similar to Lightolier Optilex.

f. Auditorium: Furnish recessed flush adjustable down-lights with a regressed lens. Lamp shall have 360° rotational and 40° vertical adjustability. Lamps shall be PAR-46, 200 watt, 2000 hour type. Supplementary lighting shall be installed as shown on drawings. Aisle lights will be supplied by the seat manufacturer but shall be wired under the Electrical Contract. Spot lights for stage shall be 500 watt adjustable units with flush elliptical openings. Downlights shall be similar to Century #396. Spotlights shall be similar to Century #1681.

g. Cafeteria: Furnish recessed downlights with interior baffles similar to PBS Standard #187-S.

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h. Kitchen and Large Toilet Rooms: Furnish recessed fluorescent fixtures for 2 - 40 watt T-12 Rapid start lamps, similar to PBS Standard #378. Lamps shall be Standard Warm White. Spacing of Toilet Room fixtures shall be as shown on drawings. Spacing of Kitchen fixtures shall be one for every 75 square feet.

i. Street and Parking Area Lighting:

1. Cable: Direct burial, single conductor, ozone resisting rubber insulated, neoprene jacketed, and suitable for use with transformer open circuit voltage.

2. Lamps: Incandescent, 10,000 lumens (roads), 15,000 lumens (parking area).

3. Standards: Aluminum (mounting height 30 feet) with single or double 8 foot arms as required. Standards shall have transformer type bases with insulating transformers.

4. Electrical distribution: Series, 20 amperes.

5. Regulators: Automatic, high power factor, askarel filled, rated 480 volt, 20 ampere type. Provide protective relays which will automatically disconnect regulators from line on open series circuit. Regulators shall be controlled by fully automatic, electrically operated 480 volt air circuit breaker with 120 volt, 60 cycle control coil and rating as indicated. Circuit breaker shall be equipped with necessary auxiliary contacts and standard attachments, and shall be operated by astronomic electrically wound time switch. Furnish three position "ON-OFF-AUTOMATIC" switch for manual operation of circuit breaker. Furnish a total of 12 - 30 kw regulators.

j. Security Lighting:

1. First Floor Roof: Furnish floodlights approximately six feet in from the parapet around the entire lower roof of the building directed toward the building tower. Fixtures shall be heavy duty type for 250 watt lamps with a hinged 100° horizontal spread lens. Fixture shall have 15° vertical and 116° distribution characteristics. Fixture shall be similar to Crouse-Hinds ADE-12.

2. Lower Floors, Building Face: Furnish heavy duty 1000 watt floodlights mounted on the ground, with hinged diffusing lens. Floodlights shall be approximately 50 feet from the building and spaced 50 feet on centers around entire perimeter of building lower floors. Floodlights shall be similar to Crouse-Hinds ADE-16.

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3. Security Fence: Furnish standards and luminaires similar to street lighting equipment to operate on 20 amperes series distribution. Lamps shall be 10,000 lumen type. Approximate distances will be 14 feet inside fence, 150 feet between luminaires, and 25 feet mounting height, to provide a minimum light pattern of 10 feet inside of fence and 20 feet outside of fence.

k. Emergency Lighting: The following areas will be on this system:

1. One quarter of all office areas except those within 15 feet of windows.
2. Exit signs, stair lighting, lights on 75 foot centers in corridors, and at changes of corridor direction.
3. One quarter of all roadway and parking luminaires.
4. Entire security fence.
5. Power house as indicated.
6. Aviation warning lights at buildings highest points and on elevated water tanks.
7. Exterior lights at entrances.
8. Gate Houses.

E-30 LIGHTNING PROTECTION SYSTEM

- a. Provide lightning protection for Boiler House stacks.
- b. Provide lightning protection for Main Building including the following:
 1. Air terminals on 25 foot centers around periphery of building.
 2. Cross ties across building on 50 foot centers with air terminals on 25 foot centers.
 3. Down cables on 100 foot centers around periphery of building.
 4. Ground rods at base of each down cable.

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5. Cable connection between ground rods to form a complete ground loop.

E-31 SUPERVISORY ALARM SYSTEM

a. Provide the following alarm systems for 18 vaults located throughout building. Alarms and signals shall appear at a central point located on the Ground Floor:

1. Door supervision indicating when closed door is opened.

2. Wall penetration detection system utilizing contact microphone principle.

b. Provide door supervision indicating when closed door is opened for the following:

<u>Floor</u>	<u>Number of Doors</u>
Basement	9
Ground Floor	42
First Floor	45
2nd Floor	12
3rd Floor	11
4th Floor	9
5th Floor	13
6th Floor	12
7th Floor	15
Penthouse	6
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Alarms and signals shall appear at a central point located on the Ground Floor.

c. Provide window grille supervision for the following areas. Each circuit shall be wired to a central control point on Ground Floor.

<u>Floor</u>	<u>Number of Windows</u>	<u>Number of Circuits</u>
Ground Floor	76	8
Second Floor	40	4
Seventh Floor	32	4

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d. Provide closed circuit, electrically supervised rate-of-rise, and fixed temperature fire alarm systems for the following areas. Provide one detector unit for each 500 sq ft of area. Total area for all systems will be 84,000 sq ft. Provide the following number of systems with annunciator panel located at a central control point on Ground Floor.

<u>Floor</u>	<u>Number of Systems</u>
Ground Floor	44
First Floor	19
Second Floor	2
Third Floor	3
Fourth Floor	1
Fifth Floor	6
Sixth Floor	1
Seventh Floor	5

E-32 ANTENNA SYSTEM

Provide 3 - 3" conduits from Roof above Core A to Telephone Equipment Room on 1st Floor.

E-33 POWER SUPERVISORY ALARM SYSTEM

a. Provide a complete supervisory system for the following:

1. 13.2 kv outdoor circuit breakers
2. 4.16 kv outdoor circuit breakers
3. 3750/4687 kva outdoor transformers
4. Batteries
5. Network Protectors
6. 500, 1500 and 2000 kva transformers
7. 4000 ampere, 480 volt circuit breakers for dropping non essential load.

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b. The supervisory system shall indicate an alarm at operating engineering position in power house and bell in Engineer's Office for over-temperature and/or pressure of transformers with inherent means to automatically disconnect same after a predetermined time, for indication of breaker position, for indication of position of battery-charging control units, and for under-voltage of batteries.

E-34 TV CAMERA SYSTEM

Provide one 1" empty conduit from the following locations to Security Control Office in Wing #3 on First Floor. At each location provide one blank outlet box from nearest emergency panel:

<u>Floor</u>	<u>Location</u>
Basement	<ul style="list-style-type: none"> 1. Ramp to Underground Parking Area. 2. Elevator Lobby.
Ground Floor	<ul style="list-style-type: none"> 1. Each loading dock area. (total 2) 2. Each entrance area. (total 8)
First Floor	Each entrance area (total 5).

E-13